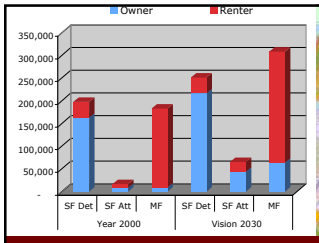



# Sustainability Scenario Planning Tool

## Project Update and Demonstration
## Subregional Coordinators Meeting

*Fregonese Associates Inc.*
*1525 SW Park Avenue, Suite 200*
*Portland, OR 97201*
*503.228.3054*

FREGONESE ASSOCIATES

ENVISION Tomorrow
suite of urban and regional planning tools

# Why Use Scenario Planning?

- Compare choices and consequences
- Develop strategies to optimize outcomes
- Plan for anticipated growth



# What is Envision Tomorrow?

- Suite of planning tools, including Scenario Builder extension for ArcGIS and Return on Investment (ROI) model
- Allows quick land use scenario creation and evaluation using market feasible, prototype buildings
- Works at both neighborhood and regional scales
- Compare scenarios based on a variety of land use metrics, as well as resource usage, transportation and environmental impact

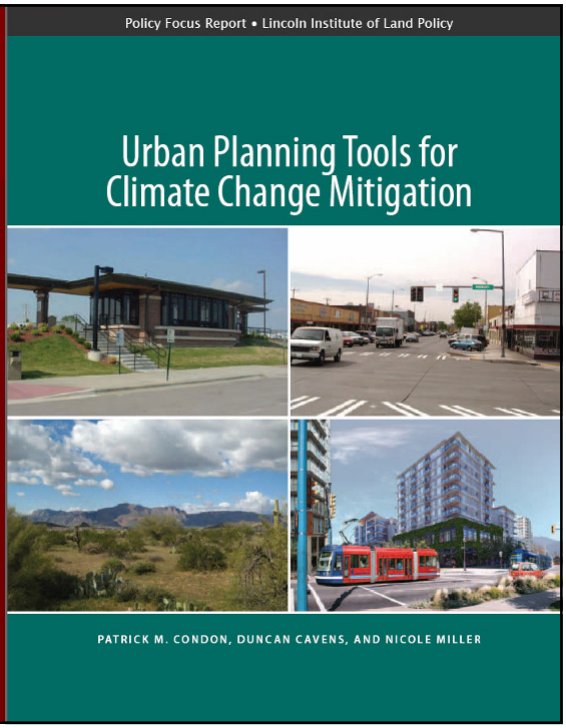
ENVISION Tomorrow
suite of urban and regional planning tools

# Who is Using Envision Tomorrow?

- Southern California
- Chicago
- Southern Louisiana
- Dallas
- Tulsa
- Portland, OR

# Lincoln Institute For Land Policy

Case Study in *Urban Planning Tools for Climate Change Mitigation* (2009)




# Scenario Building Process

**Building Types** → **Land Use Types** → **Scenario Development** → **Evaluation**

1

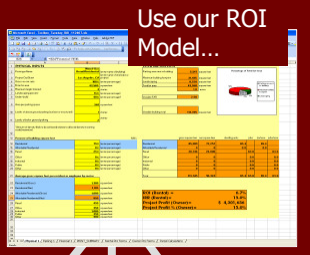
Scenario development starts by creating a library of building types that are financially feasible at the local level.

# Create Prototype Buildings

Why start with buildings?

*Easily modeled & lots of existing data*

- Density and Design
- Rents and Sales Prices
- Costs and Affordability
- Energy and Water Use
- Tax Revenue



Use our ROI Model…

**…to Create a Range of Buildings**

# Scenario Building Process


**Building Types** → **Land Use Types** → **Scenario Development** → **Evaluation**

2

Define the buildings, streets and amenities that make up all the "places" in which we live, work and play.

# Land Use Type Mix

A Variety of Buildings, Streets and Amenities Create a "Place"

Town Center

Medium-Density Residential

Single-Family Residential

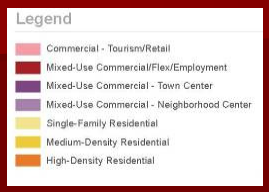
# Scenario Building Process

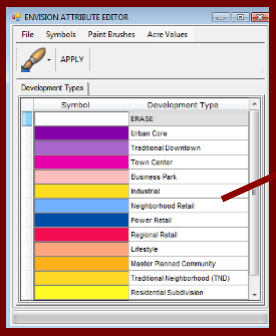
**Building Types** → **Land Use Types** → **Scenario Development** → **Evaluation**

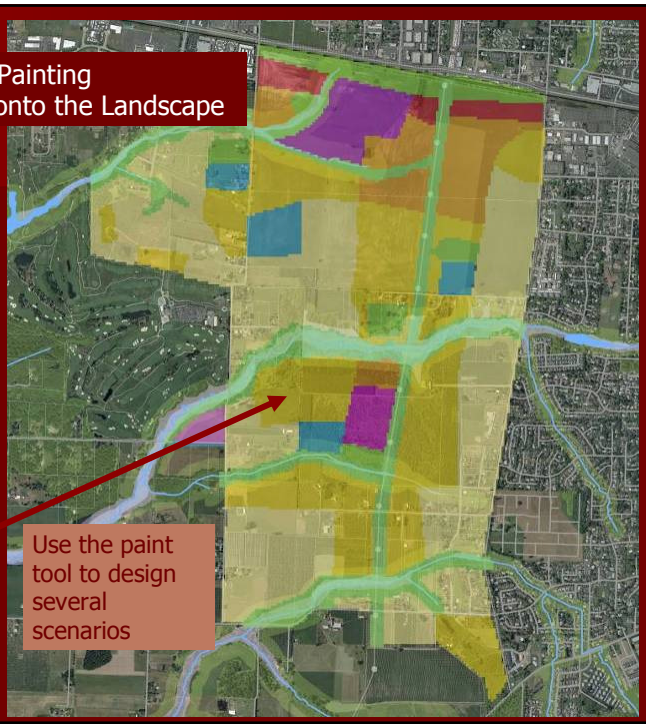
3

Use the Scenario Painter to design several possible future land use scenarios to test the implications of different decisions or policies.

## Design Scenarios by Painting Development Types onto the Landscape



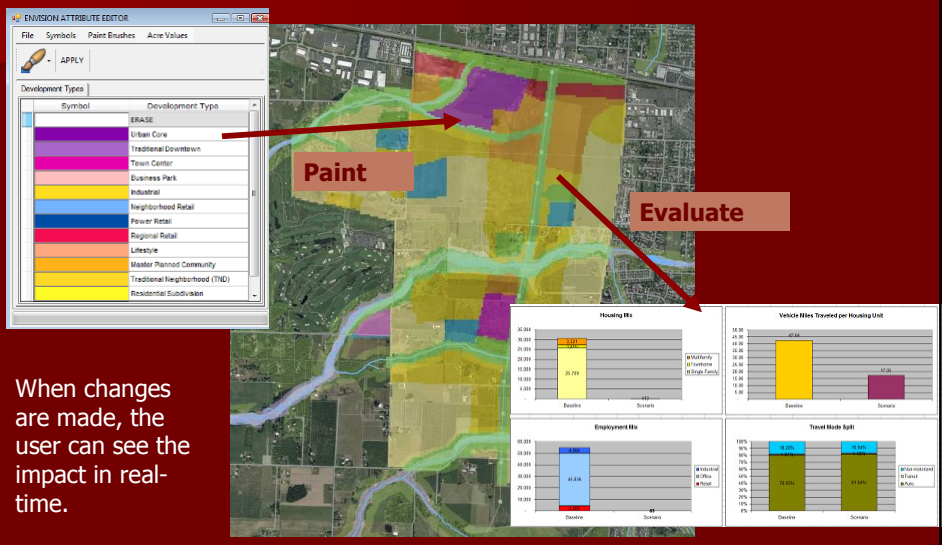

## Scenario Building Process

**Building Types** → **Land Use Types** → **Scenario Development** → **Evaluation**

4

Compare the scenarios and monitor the impact of land use decisions in real-time.

# Real-time Scenario Evaluation




When changes are made, the user can see the impact in real-time.

# Scenario Evaluation

- Evaluation criteria include:
  - Land Use: density and mix of uses
  - Transportation: mode choice
  - Housing: mix and affordability
  - Fiscal Impact: local revenue and infrastructure
  - Environment: open space and agriculture land consumption
  - Sustainability: energy use, carbon footprint, water and wastewater

## Current Project Objectives

- ✓ *"Develop a model that local jurisdictions can use to analyze the impact of different land use scenarios on vehicle ownership, vehicle use, mode shifts, and their associated effects on GHG emissions."*
- ✓ *"Enable local planners and decision makers to quantify and visualize the outcomes of their different development options and choices"*

## Sustainability Scenario Planning Tool

- Significant customization of existing scenario tool to meet SCAG's needs
- Real challenge is to design a sophisticated tool with a non-technical interface
- Balance real-time performance with technical accuracy and meaningful outputs

# Requirements Driven by SB 375

- Regional GHG reduction targets for 2020 and 2035 to be set by CARB in 2010
- Primary emphasis on reducing vehicle travel through compact, transit-oriented land use
- MPOs must develop Sustainable Community Strategy (SCS)
  - ✓ Becomes land use element of RTP
  - ✓ Forecasts a development pattern and transportation network capable of achieving the GHG targets
- Regional SCS a bottoms-up approach
  - ✓ Actively involve subregions and local jurisdictions
  - ✓ Workshops to include urban computer simulation modeling

# Requirements for Sustainability Tool

- Sensitive to Key Strategies:
  - ✓ The 4Ds: Density, Diversity (mix and balance of uses), Design (walkability), Destinations (transit accessibility)
- Highly Visual
  - ✓ Clearly picture development features through mapping
- Geographically Scalable
- Interactive
  - ✓ Able to function in workshop environment
  - ✓ Allow users to experiment with scenarios
  - ✓ "Instant Feedback" on results of tests
- Understandable to Non-Technical Audiences

# Implications for Design

- Cannot use Regional Model
  - ✓TAZ structure not sensitive to land use measures
- ✓Cannot actively link to Regional Model
  - ✓4-step model sequence – long turnaround time
  - ✓Must "freeze" system performance relationships in Sustainability model when taken into field
- Visualization requires GIS Platform
  - ✓Must see all important features – development, transportation system, natural barriers
  - ✓Want both output "reports" and graphic illustration

# How the tool will be used

- Users presented with their 2035 forecast (at gridcell-level) graphically displayed using Land Use colors
- Users construct alternative scenario to explore how different land use choices affect VMT and GHG
- Can compare 2035 Forecast Scenario to their own land use scenario based on a host of indicators
  - Land use: density, housing mix, job mix, jobs-housing balance
  - Transportation: VMT, mode choice
  - Sustainability: GHG emissions
- User scenarios can be used by SCAG as direct input for a variety of purposes: forecast negotiations, Sustainable Community Strategy, etc.